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# USER GUIDE



SJ-2 Version 1.3

# **SJ-2 USER GUIDE**

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# Getting Started

- Introduction
- Installation
- Patch Data Saving
- Adjusting Parameters



Please note that if you are new to synthesis, parts of this user guide may appear to be 'a bit heavy'. Don't worry, once you start turning knobs and flicking switches on the SJ-2, it will all start to make sense.

## Introduction

Congratulations on acquiring the Manx SJ-2 synthesizer. We hope you will find the rich, organic sound of the instrument to be as satisfying as we do.

Manx Synthesizers originally started out as a vehicle to test out novel oscillator designs, whilst looking into the possibility of providing digital oscillators with more 'grunt'.

These designs share much 'DNA' with what lies under the hood of Manx instruments today. However, we subsequently shifted our attention onto the filter and envelope sections, which we felt, were still being somewhat 'trashed' by real analog gear.

For patches which feature an open filter and bland EG settings, the SJ-2 does sound similar to its predecessor, the Manx Super-Jay. However, patches with significant filtering and bold EG settings are probably the most commonly used synth sounds out there; and these are a kind of sounds in which the SJ-2 can now excel.

Please note that the SJ-2 does not attempt to model any particular hardware instrument down to the finest detail but we have tested it alongside audio examples of the awesome MKS-80 all the way through development and the SJ-2 programming functionality is rather similar to that of the hardware beast.

## General features

6 note polyphonic, with double and unison modes.

Midi Learn for all parameters; Patch memory system with full library.

Independent PWM LFOs, velocity sensitivity, generous modulation routings and much more....

## General information

The SJ-2 has no on-board effects - its output is mono.

External effects must be used if you need stereo imagery, or layer 2 SJ-2s together, then pan.

The SJ-2 can respond to velocity data but in most factory presets, this is switched off.

The SJ-2's CPU consumption is very sensitive to patch complexity.



## Installation

Please extract the contents of your downloaded RAR file to your VST plugins folder.

If you are installing the demo version of the SJ-2, please copy both the dll file and the folder into your VSTplugins folder: If this folder is absent when the SJ-2 is launched, the instrument will attempt to create one automatically, but this may be undermined by Windows security systems.

If you have already installed the demonstration version and are upgrading to the retail version (recommended), the computer will ask if you want to overwrite an existing file (since the demo and retail versions have the same file name). Click Yes. When upgrading from the demo version you don't need to copy the SJ-2 folder since it contains the same stuff.

(Note: if for some reason you can't open the RAR file, please let us know and we can send the dll & folder to you directly, via email.)

## Patch data saving

Please note that when you save a patch into the SJ-2's internal patch memory system, all variables are saved, including the test tone setting and master tune controls.

## Adjusting parameters

If you click your mouse over one of the SJ-2's continuous controls (knobs and sliders), a readout of that controllers current setting will be displayed in the 'Value' display at the bottom left of the instrument.



For continuous parameters, click and drag the respective knob or slider.

For switches, click repeatedly on the switch area to flick through the available settings.

### IMPORTANT!

You can achieve very fine adjustments for the *knobs* by clicking on the knob and dragging the cursor away from the knob *horizontally* for a good distance before adjusting the knob by moving vertically.

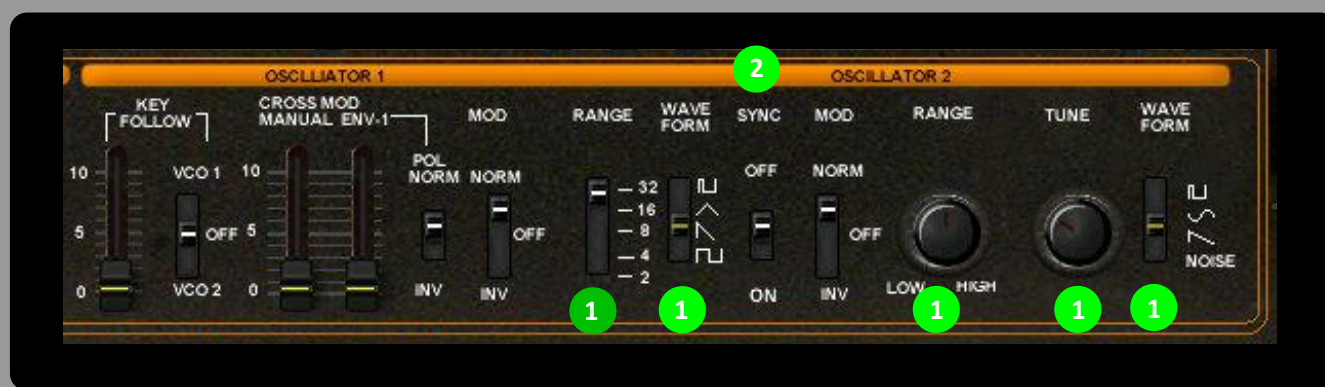
This advice is particularly pertinent to the *Master Tune* control, where precise adjustment is required.

# Programming the SJ-2

- Oscillators
- Pulse Width Modulation
- Filter
- Envelopes
- LFOs
- Oscillator Mixer



## Meet the SJ-2's oscillators



### Oscillator Overview

When playing a guitar, the sound produced originates from the strings. In the case of a synthesizer, the basic sound comes from a section called the 'oscillator section'.

Just as a guitar can have twelve strings instead of six, so a synthesizer may feature two oscillators instead of one. This is the case with the Manx SJ-2

Having two oscillators instead of one can give you a fatter sound, especially if the two oscillators are set two be slightly out of tune.

#### WAVE SHAPE AND TUNING (1)

The SJ-2 features two fully loaded oscillators; you can control the pitch and basic wave-shape of each, from the oscillator panel shown above.

Whilst the pitch of oscillator 1 can be set in only in octave intervals, the oscillator 2 pitch is continuous and is controlled by the two left side knobs, labelled 'Range' and 'Tune' respectively; these both control oscillator 2's pitch but the 'Tune' control has a much finer action.

It is a little bothersome to select an appropriate octave for oscillator 2, but this arrangement is handy when the two oscillators are synchronized (see below for details).

## OSCILLATOR SYNCHRONIZATION (2)

Normally, the two oscillators are free running (simulated); they operate independently. This means that when you press a key multiple times, the resulting sound may not be exactly the same each time, because the oscillators will interact with each other differently each time.

However, when Oscillator Sync is turned on, the 2nd oscillator will be forced to reset to the start of its wave-cycle, every time the 1st oscillator naturally works round to the start of its cycle.

If your new to synthesis and this sounds complex - don't worry. Simply try it out - you will recognise the kind of sounds sync'ing can produce since they appear everywhere in popular recorded music.

The important characteristic of oscillator synchronising is that changing oscillator 2's pitch will change the timbre of the oscillator section but the pitch of both oscillators will track the pitch setting for oscillator 1.

By modulating the 2nd oscillator's pitch using the SJ-2's envelopes or LFOs, sync'ing will provide another means to have your patch's timbre evolve as a key continues to be held down (along side with filter modulation - described later in the user guide).



### KEY FOLLOW (3)

There are several factors which determine the pitch of the SJ-2's oscillators, besides their specific tuning settings; other factors include; master-tune control, pitch-bend midi data, modulation sources and of course the keyboard itself. 

The way the oscillator's pitch responds to the keyboard is known as 'key tracking' and as you may imagine, normally it is tracked such that 12 keys up the keyboard will equal a 1 octave pitch increase, just like a piano.

Its quite rare for synthesizers to offer alternatives to this configuration - other Manx V2 synths don't - but the SJ-2 does: the two controls at the far left of the oscillator section control this:

If the switch is set to VCO1 (another term for oscillator 1), the second oscillator will continue to track the keyboard in the standard (12v keys = one octave) way, but the first oscillators key tracking will be tempered by the key follow slider next to it - fully open, this slider will again produce one octave for 12 keys but when this slider is set to zero, oscillator 1 will not track the keys at all; it's pitch will then hang purely on the other factors mentioned above.

Setting the key follow switch to VCO2 will set the oscillator 1 pitch to track the keys normally with oscillator 2 being tempered by the slider, whilst setting the switch to 'off' will cause both oscillators to follow the keyboard normally.

Use the key tracking facilities however you like, but please note that this can be a really useful feature if the oscillators are synchronised.



#### OSCILLATOR CROSS MODULATION (4)

Yet another factor which can affect the pitch of oscillator 2 is the output from oscillator 1; that is oscillator 1's waveform - when at the top of its cycle osc 2's pitch will rise and when at the bottom of its cycle, osc 2's pitch will fall.

Clearly this pitch fluctuation will be very fast indeed and will serve to provide a timbrel effect rather than discernible pitch variance.

The left hand cross-mod slider simply sets the extent to which osc 2 is modulated by osc 1. The right hand slider controls the extent to which cross modulation responds to envelope 1 (please see the section on envelopes later in the document.)

#### OSCILLATOR MODULATION RESPONSE (5)

As mentioned earlier, a number of factors can affect oscillator pitch besides the oscillator pitch controls themselves.

These other factors are said to 'modulate' the oscillators' pitch - modulate simply means 'change', and while the keyboard could certainly be described as a modulator, the term is more commonly reserved for other parts of the synth's architecture which can affect pitch - lfo's and envelopes in particular (these will be defined later in the user guide.)

The SJ-2 works as follows: parts of the SJ-2 architecture which can control pitch have their own sliders to set how much pitch modulation will occur, and this will be the same for both oscillators.

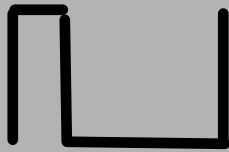
In addition, though, the way the oscillators respond to the modulation can be set individually for each oscillator from within the oscillator section, using the switches labeled (5) above.

Using these switches, you can set each oscillator to either respond positively or negatively to the modulation, or not at all.

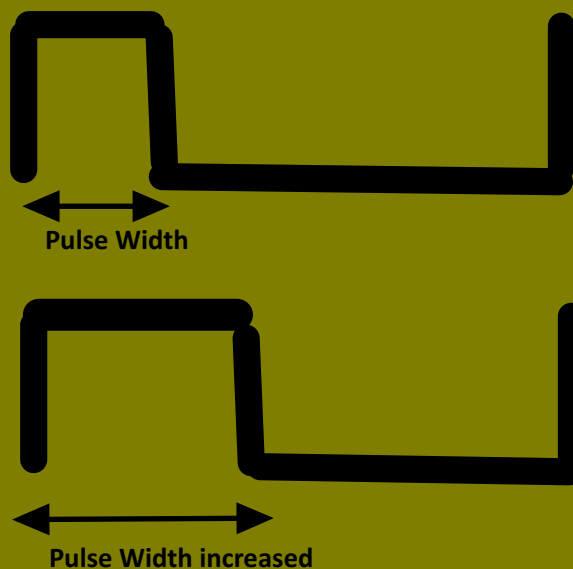
This may seem a little unnecessary, but it's actually a really neat feature and once again, is particularly useful when the oscillators are sync'ed.

## Pulse Width Modulation

Both of the SJ-2's oscillators have the option of selecting a pulse wave, which looks like this:



The pulse waves have a feature which none of the other waveforms have; The peak to trough ratio can be adjusted. We do this using a parameter known as 'pulse width'.



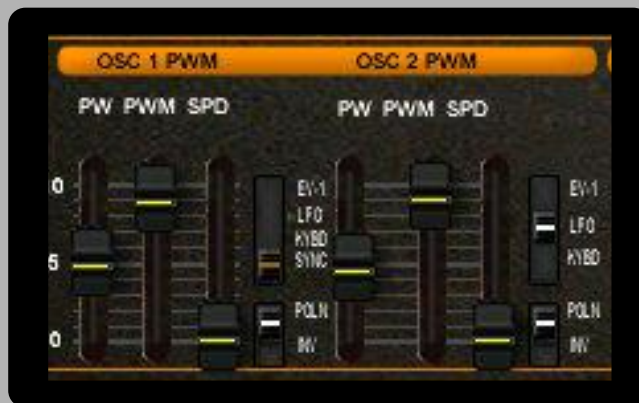
This is a superb feature for two reasons:

Firstly, one wave shape - pulse - becomes an infinite number of wave shapes; all pulse waves with different pulse widths.

The second reason is even more useful;

Because pulse width is a continuous variable, we can modulate it (vary it) in real time, using either LFOs, envelopes (see later sections), or key tracking.

Pulse width & pulse width modulation are so important that the SJ-2 has a section dedicated to them:



The controls labelled 'PW' set the pulse width for each oscillator.

If the oscillator is set to any wave other than pulse wave, the settings here will have no effect.

The actual Pulse width can be made to *fluctuate* around the point set by the 'PW' slider, by an amount set by the 'PWM' slider - this stands for 'pulse width modulation'.

And what is the nature of this fluctuation? That is set by the slider labelled 'SPD' and the switch next to it.

THE SWITCH:

(Please refer to later sections on LFOs and envelopes.)

Each of the SJ-2's oscillators has a dedicated LFO specifically for pulse width modulation.

With the switch set to 'LFO', the dedicated LFO will modulate the pulse width at a speed set by the 'SPD' slider.

With the switch set to 'EV1', envelope 1 will modulate the pulse width.

With the switch set to 'KYBD', keyboard tracking will modulate the pulse width.

With the switch set to 'SYNC', oscillator 1's LFO will modulate the pulse width of both oscillators.

The two remaining switches set the polarity of the pulse width modulation.

# SJ-2 USER GUIDE

## Meet the SJ-2's Filter



As mentioned in the introduction, considerable effort has gone into giving the SJ's low pass filter that extra bit of 'flare' one normally associates with analog technology.

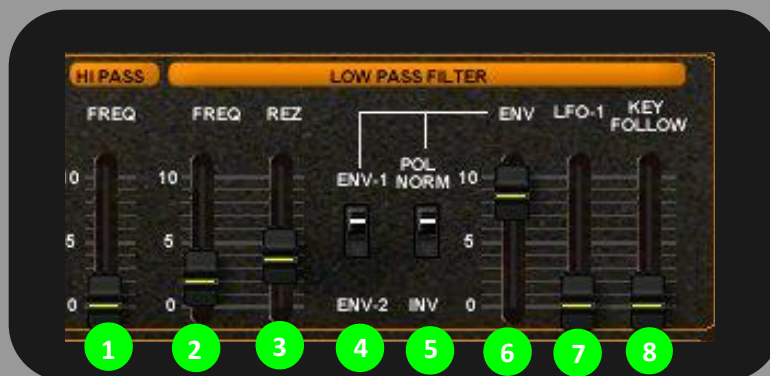
However, from a user's perspective, the filter controls are the same as you would find on any other subtractive synthesizer - if you're familiar with synthesis, you won't need to spend a long time reading this section.

If you are not already familiar with synthesis, I have provided a brief introduction to the subject in Appendix #1. Before that, here's a summary of the SJ-2 filter controls:

### HIGH PASS FILTER (1)

This cannot be modulated by other parts of the synth; the high pass frequency setting will control the cut-off point.

It essentially functions rather like a bass cut control.

**CUT-OFF FREQUENCY (2)**

- sets the cut-off frequency of the filter.

**RESONANCE (3) REZ**

- sets the resonance of the filter.



**CAUTION:** Turning up the resonance can lead to a profound increase in sound volume, perhaps unexpectedly. Please consider both your speakers and your ears and use this feature cautiously.

**ENVELOPE SOURCE (4)**

- determines whether the filter cut-off is modulated by envelope 1 or envelope 2. (please see the envelope section further on in the user guide.)

**ENVELOPE POLARITY (5)**

- determines whether the envelope modulates the filter cut-off positively or negatively.

**ENVELOPE INTENSITY (6)**

- determines how much envelope modulation is applied to the filter cut-off.

**LFO MODULATION (7)**

- determines how much LFO modulation is applied to the filter. (Please see the LFO section further on in the user guide.)

**FILTER KEY FOLLOW (8)**

This is similar to key tracking, discussed in the oscillator section earlier. When set to zero, the keyboard will not influence the filter's cut-off at all, but at higher settings, higher keys will sound brighter than lower keys.



**CAUTION:** When the filter cut-off is built up from zero using an envelope generator with a long attack time, transient low frequency rumbles can occur when the filter's output slips from inaudible to audible. To avoid this issue, be sure to add a small amount of attack time to the volume envelope. (Envelopes are discussed below.)

# SJ-2 USER GUIDE

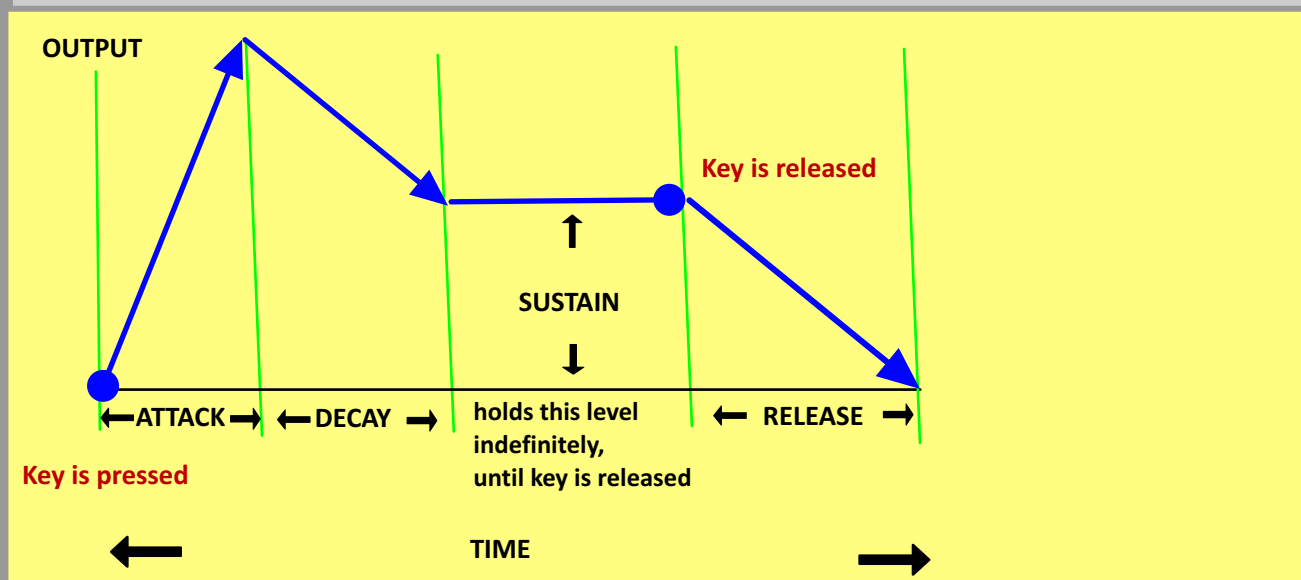
## Meet the SJ-2's envelopes



The SJ-2 has two ADSR type envelopes, which can be scaled by velocity and key-tracking

Envelopes are triggered when a key is depressed; from this point the output of the envelope (used for modulation) will develop over time in a predictable profile, defined by the user, using controls in the envelope section. The configuration of these controls varies from one instrument to another, but a popular standard which emerged early on is to have four controls - Attack, Decay, Sustain & Release.

The following graph shows how these four controls operate on the envelopes output:



The SJ-2 has two envelopes, both triggered simultaneously by depressing a key. The output of these envelopes can be assigned to various parts of the synth; pitch, volume, filter cut-off, cross-modulation and more.



Envelope 1 to Pitch

Envelope 1 to Pulse Width

Envelope 1 to oscillator cross modulation

Envelope 2 to volume

Switchable: Envelope 1 or Envelope 2 to Filter cut-off.

The default configuration for the SJ-2 is to have envelope 1 control filter cut-off and/or other attributes such as pitch, while envelope 2 is used exclusively to control volume. However, by switching to 'envelope 2' in the filter section, you can have envelope 2 control both volume and filter cut-off, whilst reserving envelope 1 for other purposes.

#### VELOCITY CONTROL



Velocity (how hard a key is struck) can be used to scale the envelopes in both axis; the amount of intensity scaling is controlled by the left slider highlighted above; the right slider controls time scaling.

This effect can be applied separately to envelopes 1 and 2 by using the two switches labeled 'DYNAMIX' in the envelopes section.



**Key follow:** These sliders affect the intensity of the envelope generators according to how high up the keyboard a particular key is pressed. High settings will cause higher keys to follow a more intense envelope profile.

## IMPORTANT CONSIDERATIONS SPECIFIC TO MANX ENVELOPES



### Self-Compensating Sustain Level

**CAUTION:** If you reduce the SJ-2 envelope's SUSTAIN amount, the peak of the envelope's output can actually rise - the SJ-2 attempts to recover overall volume level. This helps to offset any loss of volume which the patch might incur due to the reduced sustain setting.



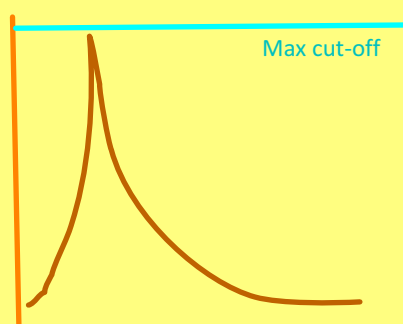
However, at very low sustain settings, the effect can be quite dramatic.

If an envelope which is controlling volume is subject to a reduction in sustain level, **PLEASE PROCEED CAUTIOUSLY** in order to protect equipment and prevent ear damage.

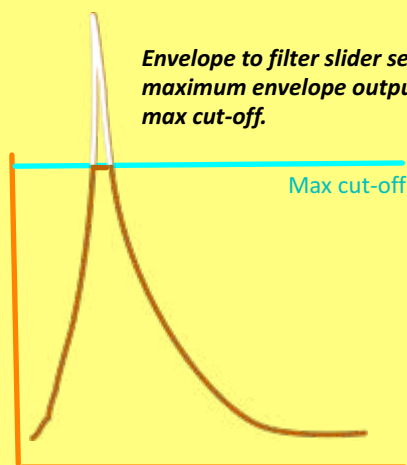
### ENVELOPE TO FILTER CLIPPING

Please note that the maximum output from either of the SJ-2's envelopes exceeds the highest cut-off frequency setting (all frequencies allowed through) by a wide margin. This is deliberate and can be used to refine a cut-off envelope profile around its peak, as shown below:

*Envelope to filter slider set so that the maximum envelope output is less than max cut-off (all frequencies allowed through)*



*Envelope to filter slider set so that the maximum envelope output exceeds max cut-off.*

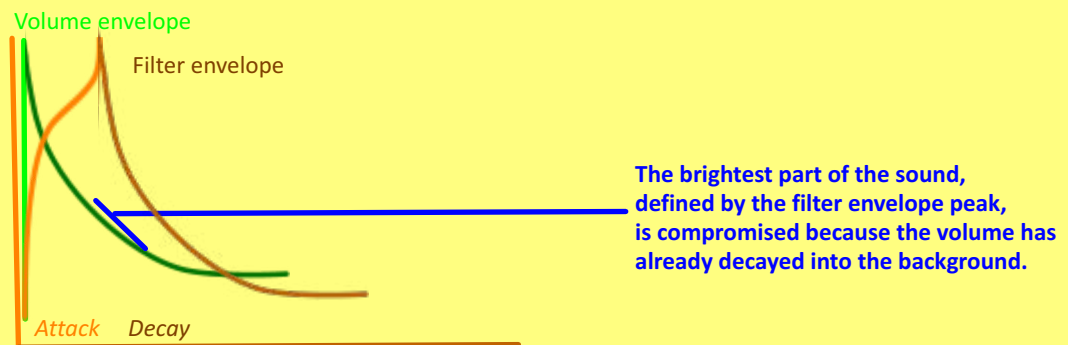


In the second example, because the peak is 'clipped', the filter remains fully open for a longer period and this will have a dramatic effect on the sound.

Please note that adding filter cut-off manually, in addition to envelope output, will further intensify this effect since the two sources (cut-off slider & envelope output) are simply added together.

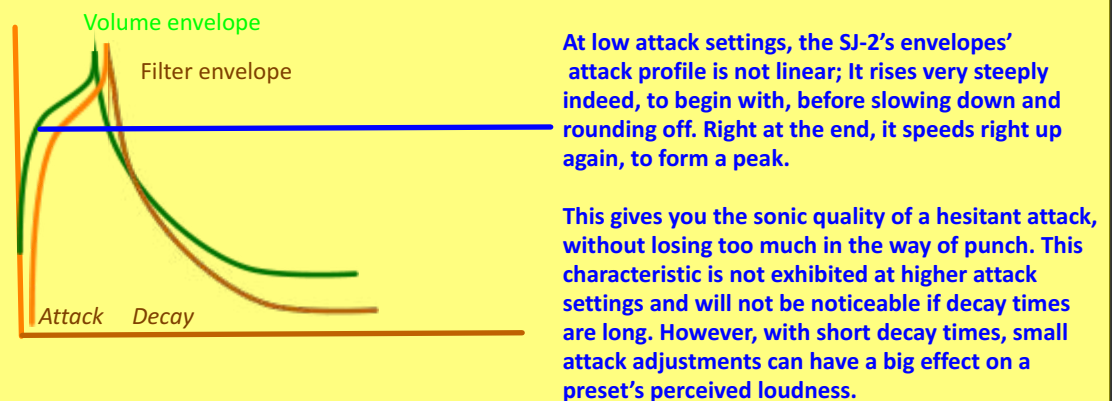
## SHORT ATTACK TIMES

At extreme settings, the peak of an SJ-2 envelope can be so snappy that it becomes important to co-ordinate the attack times of the two envelopes, in order to prevent the filter from peaking after the volume has decayed to sub-optimal levels. This is really only an issue when you have some moderate attack time on the filter envelope, zero attack on the volume envelope but a swift decay on the latter. The following diagram illustrates the issue:



One solution is to add a little bit of attack time to the volume envelope as well. (Increasing volume 'decay' time will also solve the problem but this will drastically change the nature of the sound!)

One might be concerned that adding some attack time to the volume envelope might 'blunt' the sound and leave it with out much punch. In the case of the SJ-2, this concern is unfounded, because at low settings, the envelope's attack is loaded toward the end of the attack phase - the following diagram will hopefully make this clearer:



Even in the case that the filter envelope's attack is set to zero, adding a small amount of attack to the volume envelope can significantly increase a sounds punch, because the volume's peak lingers for more time overall, whilst the decay is still abrupt and dramatic.

Again, if sustain is set to high, or decay is slow, then the effect described above will not be noticeable.

## Increasing sustain level affects the decay time .....

In fact this is an illusion - the decay time itself remains the same but with a higher sustain level, the attenuation from peek to sustain is reduced so the decay appears to be less pronounced.

Simply readjust the decay time to compensate for this.

Changes to resonance setting may similarly affect perceived time; again, simply readjust the decay setting to compensate if required.

# SJ-2 USER GUIDE

## Low Frequency Oscillator



### LFO Destinations

Just like the SJ-2's main oscillators, the low frequency oscillator (LFO) creates waveforms. You can select from four different wave-shapes; sine, triangle, square and random. Unlike, the main oscillators, the LFO is not influenced by which key has been depressed; the frequency is controlled by the slider labeled 'RATE' in the LFO 1 section and it can go down to sub-audible frequencies. The purpose of the LFO is to provide a cyclic control output and it can be sent to various places, in a similar way to the envelope generators discussed earlier.

The slider labeled 'DELAY' will cause the LFO output to build from nothing to its full amount over a period of time, rather like the attack control in an envelope generator.

The SJ-2 actually has two flexible LFO's; the second one appears in the SJ-2 Control Section, described later. (In addition, there are dedicated LFOs for each oscillator's pulse width, bringing the total to 4.)

The SJ-2's second LFO can only provide a sine wave and has no delay function. It can control either pitch or filter cut-off. The important thing about LFO 2 is that its intensity is scaled by modulation wheel data.

## Other Programming Features



**OSC MIX:** this allows you to adjust the volumes of the SJ-2's main oscillators. Note: if you find that the SJ-2 filter is distorting at high res settings, please try turning these volumes down a little.

**ENV RESET:** not currently implemented.

# The SJ-2 Control Panel

- Programmer
- Portamento
- Bend Range
- Unison Mode
- LFO 2
- Arpeggiator
- Midi Learn
- Zoom Function



## SJ-2 USER GUIDE

The SJ-2 control panel provides all the input you need to effectively control the synthesizer. Here, you will find master volume and master tune knobs, facilities to load and save patches, polyphony assignment, a second LFO and a basic arpeggiator. Please note that apart from the patch memory menus, all controls in this section save with the patch, including Master-Tune and Test-Tone controls.

### PROGRAMMER



#### Patch menus:

Click on the white button labelled 'Patch' in order to select a patch. Note that if you make alterations to a particular patch, those alterations will remain in effect if you select a different patch, but will not be present if you launch the SJ-2 on another occasion. Copying patches from one memory slot to another can be achieved by clicking on the menu labelled *File*. This menu also includes options for saving & loading either individual patches (presets) or the entire bank, as discrete files on your hard drive.

**Patch display:** displays the currently selected patch.

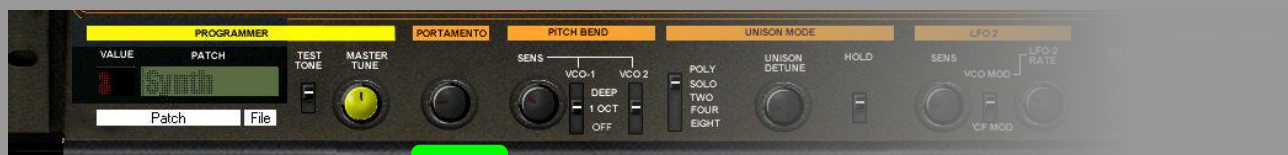
**Value display:** displays the value of the current or last adjusted parameter setting.

There are no facilities on the SJ-2 to layer two patches together or split the keyboard between two patches. However, you can achieve these configurations by launching 2 instances of the SJ-2 in your host program and controlling them from the host program.

#### Test Tone:

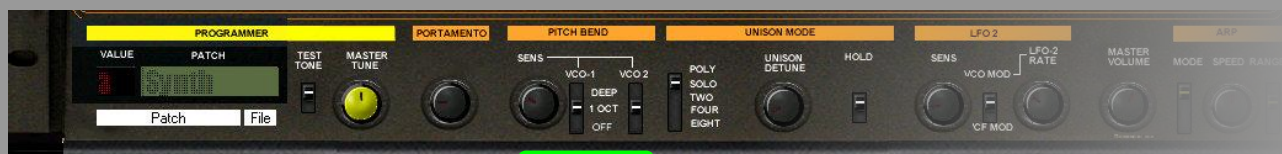
Use this to check that the SJ-2 is correctly set up within your host software. If pressing keys does not yield a sound but the Test Tone can be heard, then the chances are that the SJ-2's midi input is not configured correctly. The test tone emits a pitch of middle C ' you can thus check that the SJ-2 tuning is correct.

### PORTAMENTO



The SJ-2 features polyphonic portamento.

### PITCH BEND RANGE



Yes, this entire section is devoted to pitch bend range. It's more flexible than is usually available; the pitch bend effect can be controlled separately for each oscillator and the range can go up to 2 octaves each way.

## UNISON MODE



The SJ-2 can play a maximum of 6 notes at the same time. Use the switch in the Unison mode section to layer multiple notes under each key. Here is a breakdown of the possible settings:

**Poly** - The SJ-2 is in its normal polyphonic mode (6 voices).

**Solo** - The SJ-2 acts like a monophonic synthesizer.

**Two** - The SJ-2 becomes 3 note polyphonic and two voices are stacked for each note played, these two voices will be detuned in accordance with the Unison Detune knob.

**Four** - As above, but 3 voices are stacked up and the polyphony is reduced to 2 note.

**Eight** - All 6 voices are stacked in unison and you can only play one note at a time. Please note that it is not possible to set envelope release to more than zero in this mode.

Unison Detune ' allows stacked voices to be detuned.

**Hold Switch** : This will hold notes currently being played until the switch is reset.

## LFO 2



The SJ-2's second LFO is briefly described in the programming section of this guide. Note that this LFO only 'kicks in' when modulation wheel is applied.

## ARPEGGIATOR



The SJ-2's arpeggiator switches are not marked up, but they are very simple; the left switch has 4 settings:

(1) Arpeggiator Off (2) Descending Pattern (3) Ascending Pattern (4) Ascending & Descending Pattern

The right switch controls octave range, ranging from 1 to 4.

Speed is hard sync'd to the host's clock and the 'Speed' knob will allow you to select multiples of the external BPM.

When the arpeggiator is turned on ( Mode switch is anything other than at its top position ) the 'hold' switch, found in the Unison Mode section will hold the arpeggio, not the individual notes.

## Continuous Control & Midi Learn

Right click on any switch or knob to bring up a menu which will allow you to either manually assign a continuous controller number or use the Midi Learn facility:

Simply click midi learn and then adjust the control on your midi control keyboard which you would like to associate with the SJ-2 parameter.

When you save your song the continuous controller assignments will be saved and will be functional when you reopen it later.

If you save a preset or bank, the controller assignments will be saved with the bank or preset.

If you open a previously saved bank or preset, the current controller assignments will be lost and those contained in the loaded bank / preset will come into effect.

If you open a single preset, the controller assignments saved with that preset will be loaded into the SJ-2 and propagated across all of the patches in the SJ-2 ' you can not have controllers assigned differently for different patches.

When you open a new song and launch the SJ-2, the default factory bank is automatically loaded which doesn't contain any controller assignments at all. But you can then load up a preset (which you saved previously) which has the controller assignment configuration that you wish to use, into an empty slot. The controller assignment configuration will then apply to all patches in the SJ-2. This allows you to work with many different configurations according to your needs at any given time.

## Zoom Out

Clicking on the discrete black hotspot in the top left of the programming view-port will cause the SJ-2 to 'zoom out' revealing its appearance from a distance. You can not program the instrument from the zoomed out view - but you can simulate 'stepping back' from the instrument whilst consolidating one's thoughts.

Click on the image to return to the programming view-port.



# Appendices

## - Appendix One:

*Introduction to audio filters*

## - Appendix Two:

*Troubleshooting Problems*

## - Appendix Three:

*Other Information*

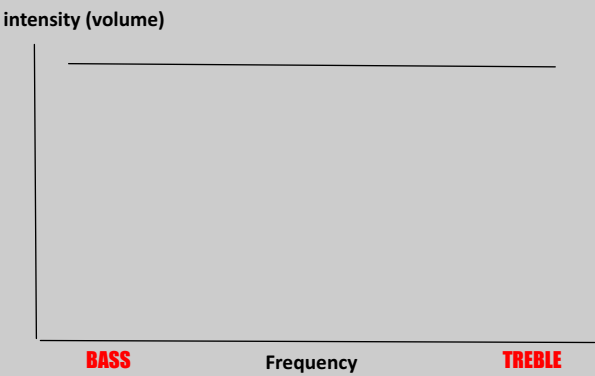


# Appendix One: A Brief Introduction To Audio Filters

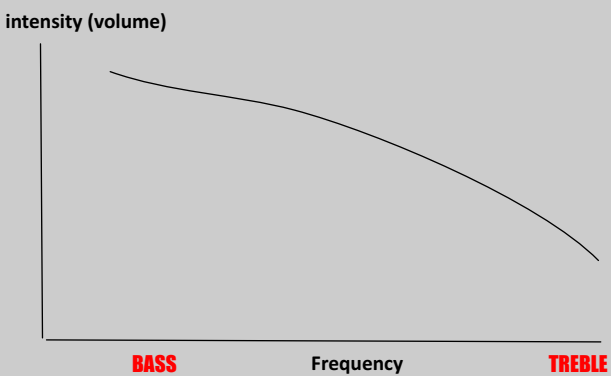
## The basics.....

You may think of a *synthesizer filter* as being rather like a single ‘tone’ control that you might find on a home audio system such as a personal CD player. However, it’s an extremely *intense* tone control; so much so that when the tone control is turned down to its minimum setting, the sound disappears all together!

Synthesizer filters and EQ devices allow us to adjust the balance of *frequencies* in a sound; bass refers to low frequencies and treble refers to high frequencies. Frequency is an interesting subject and is discussed below.



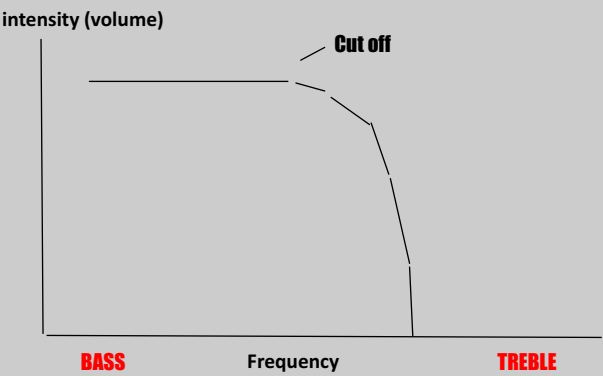
Tone control set to fully open



Tone control set to minimum

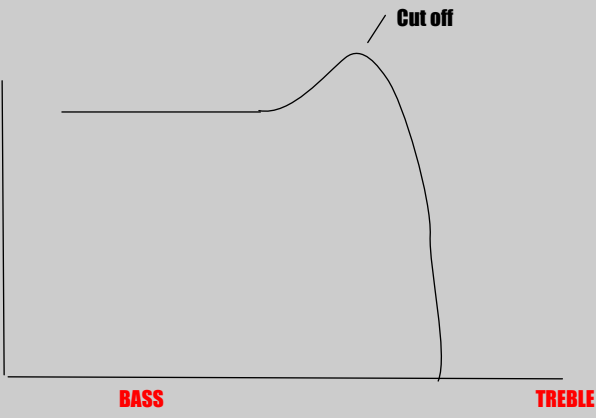
Please note that this type of EQ cannot remove any frequencies entirely

### Graphic view of the action of a standard audio player tone control



Cut-off set just up from midway (no resonance)

Please note that a little way beyond the cut off point, frequencies are removed entirely.



cut-off set just up from midway, with resonance applied

### Graphic view of the action of a synthesizer low pass filter

## RESONANCE

The last of the graphs above introduces another feature of synthesizer filters - resonance. On the SJ-2 filter, the resonance is controlled by the slider labelled ‘REZ’. When resonance is applied, frequencies around the cut-off point are emphasised, as shown in the graph. At very high settings, this emphasis results in an audible high pitched squeal, which can be used to great effect.



**CAUTION:** Turning up the resonance can lead to a profound increase in sound volume, perhaps unexpectedly. Please consider both your speakers and your ears and use this feature cautiously.

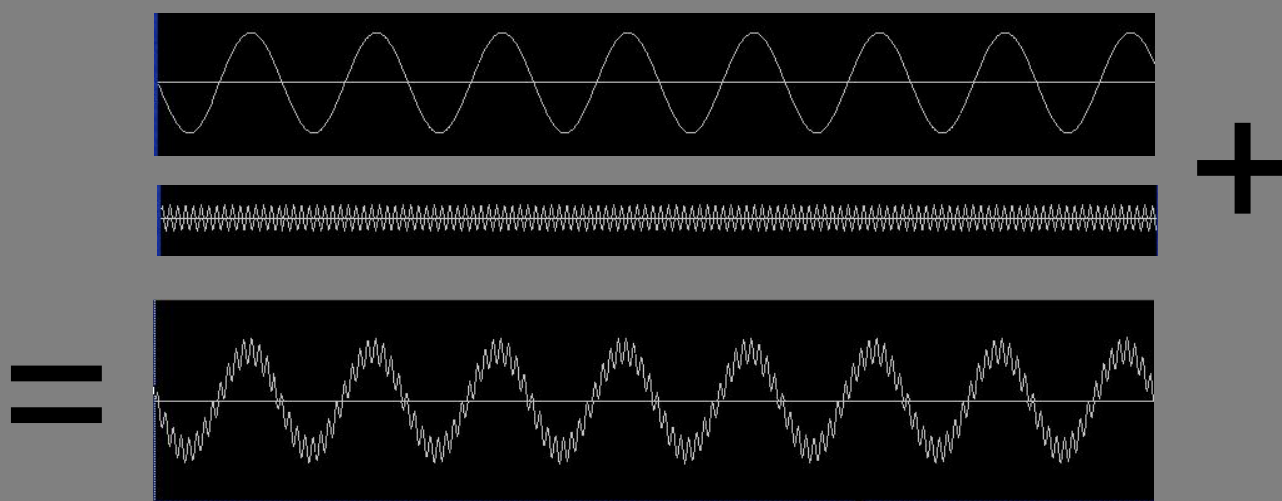
## Frequency and Waveforms.....a little bit of magic!

It just so happens that sound waves don't like to propagate through air in any form other than a sine wave.

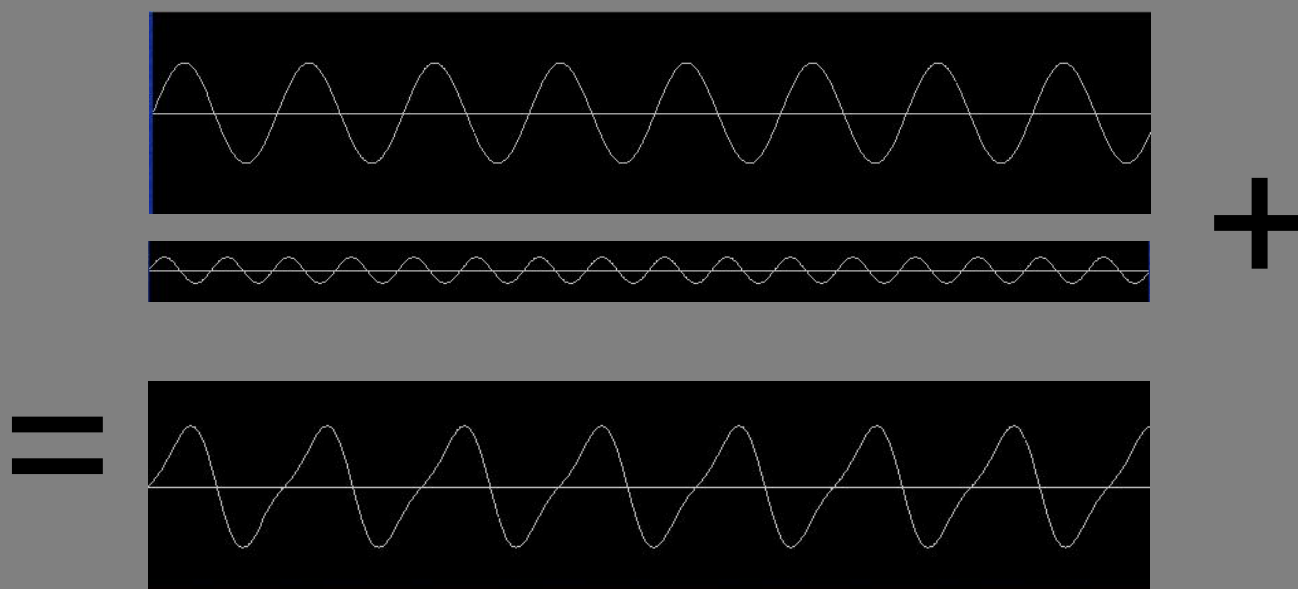
It stands to reason; air which is of a higher pressure because of a sound wave will want to expand quickly, but this urgency will dampen off as the pressure returns to normal, and a subsequent rebound in the other direction will complete a sign wave pattern. Similar physics are at work in a swinging pendulum - it will only prescribe a sine wave pattern.

However, we can clearly hear square or sawtooth shaped waves coming out of a synthesizer. And, although they don't commonly occur in nature, you can hear these waves coming off of electrical installations and other machinery as well. How is this so?

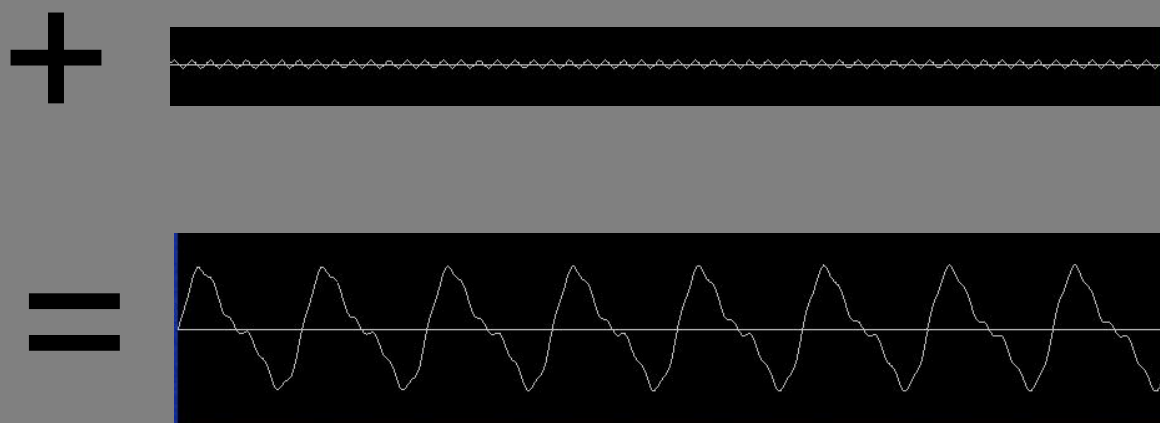
The answer lies in adding sine waves together - in other words, hearing more than one sine wave at the same time. Consider the diagram below, which graphically illustrates hearing a loud low pitched sine wave, and a much quieter high pitched sine wave, both at the same time:



If that appears to be intuitive, this instance may not. Look what happens when we decrease the gap between the high and low sine waves, so now they are of a similar but not identical pitch:



If we add yet another sine wave, higher pitched and quieter than the others, we get this:

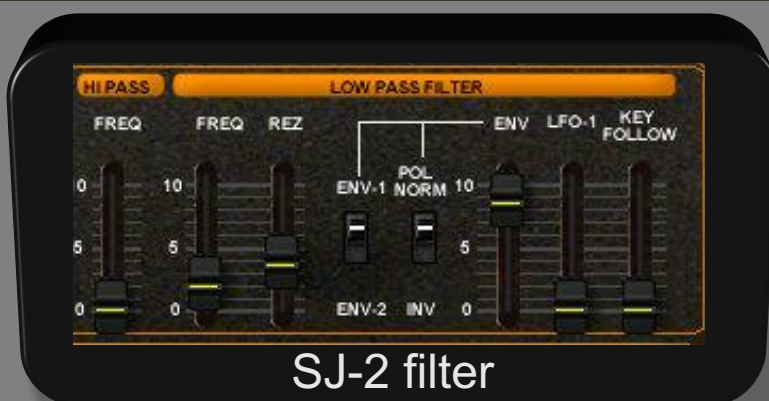


As you can see a regular waveform which is not a sine wave begins to emerge. It turns out that when many different sine waves are added together, the resulting wave-shape can be anything at all. In complex cases such as speech, you are still hearing a 'chorus' of sine waves, but in this case, the relative volumes and pitches of those wave would be constantly changing.

When an equalizer (EQ) or filter is applied to a sound, it is adjusting the relative balance of the component sine waves in that sound. A sound which is bright will have louder high frequency sine waves than a sound which is dull.



An EQ device



SJ-2 filter

# SJ-2 USER GUIDE

## Appendix Two

### TROUBLESHOOTING & KNOWN ISSUES

These issues apply to SJ-2 version 1.3 and may be resolved in subsequent versions.

#### Defaulting to Patch 1, upon start-up:

With some VST host programs, when you reopen a song which contains an instance of the SJ-2, for some reason the host software tells the SJ-2 to default to the first patch. So, for example, if you're working on a song which includes the SJ-2 set at patch number forty (which has been tweaked to your liking), upon saving and reopening the song, the SJ-2 is not set as it was when you saved, but instead is set at patch number one. This is a serious irritant because the recall of all settings within a particular song is one of the best features of virtual studio technology.

This problem is not unique to Manx Synths and only occurs under certain conditions with particular hosts. None the less, we will look at resolving this issue in future updates.

If you experience this problem, please note that the settings you applied to the patch you were working with will have been properly saved with the song, so there should be no problem if your song includes several SJ-2 patches, controlled by program change events.

Setting a program change key in your host program will ensure that the SJ-2 returns to where you left it.

Alternatively, you can apply the following work around:

1 ' copy the patch you are working with into patch#1 memory slot using the SJ-2s 'patch menu' button.

2- Save your song. When you reopen it later, if the SJ-2 defaults to patch 1, its no longer a problem and everything will be just as it was when you saved.

---

#### Unison mode - no stacking:

If unison mode fails to stack voices appropriately, please ensure that your host software is sending midi data to the SJ-2 via channel 1. The SJ-2 is not multitimbral (since you can have multiple instances running within the host software). There for there should be no requirement to use any midi channel other than 1.

---

#### Selecting different waveforms whilst a note is playing:

Sometimes this leads to some strange behaviour with the oscillator output. This is easily resolved by either briefly changing the unison mode setting or briefly jumping to another patch and back again.

---

#### File Menu buttons not working properly

People may find that on some systems, the buttons which increase and decrease the numbers in the data fields presented in the file menu do not respond properly. If this is the case, simply fill the data fields in manually.

If you click 'load patch' and nothing happens, just click 'load bank', than hit 'cancel' and then return to load patch again.



# Appendix Three- Information for users

## CREDITS

We would like to thank the following contributors:

Jeff McClintock.

David Haupt, Daz Disley, Rob Herder, Rick Jelliffe, Christian-W. Budde & Chris Kerry, who have provided code used in Manx synthesizers.

## END USER AGREEMENT

**You must agree to the following terms and conditions before installing and using the Manx SJ-2 Demo version:**

You may not attempt to disassemble or alter the SJ-2 demo DLL or accompanying files in any way.

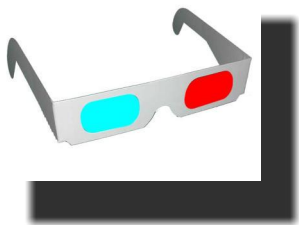
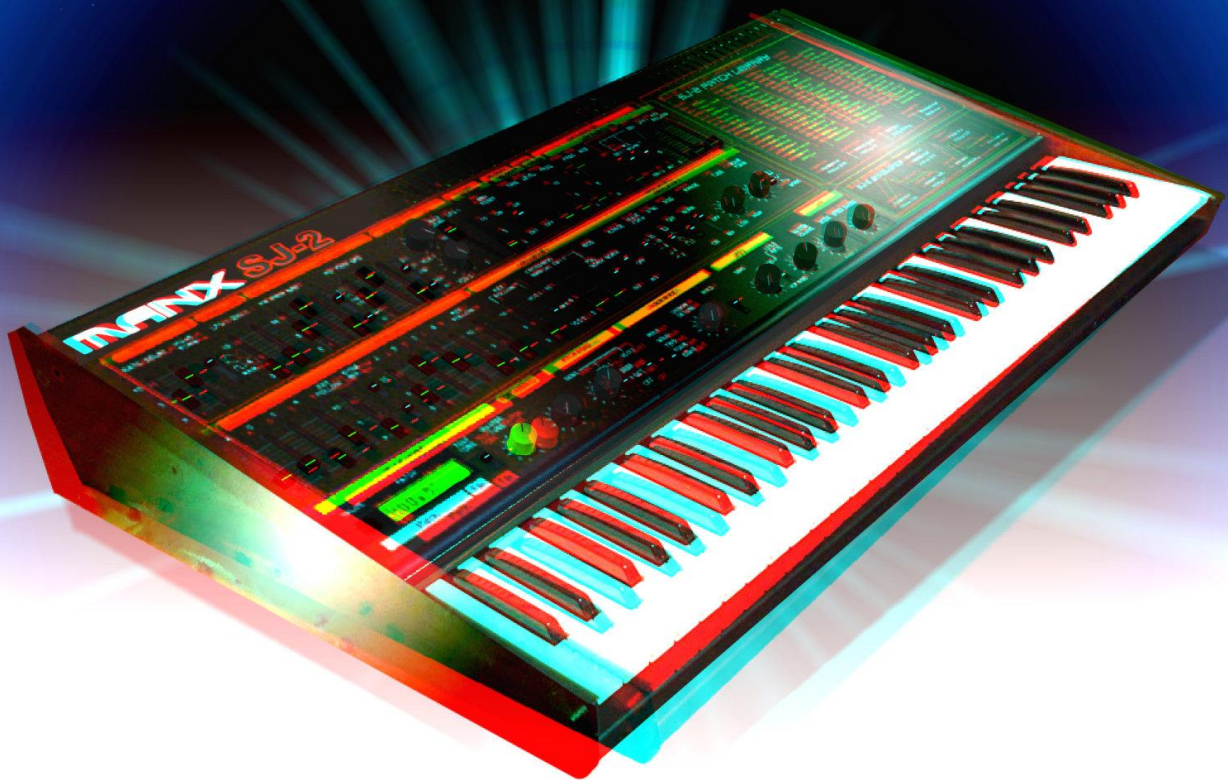
You can distribute the SJ-2 demo provided you do not directly profiteer from the distribution and credit the SJ-2 as a Manx product.

**You must agree to the following terms and conditions before installing and using the Manx SJ-2 retail version:**

After purchasing the SJ-2 retail version you are licensed to use this on up to a maximum of 3 computers provided that you are the sole owner and user of these computers.

You may not attempt to disassemble or alter the SJ-2 DLL or accompanying files in any way.

Please do not distribute the SJ-2 DLL to other individuals.



**3D Anaglyph  
representation of  
the Manx SJ-2  
Synthesizer.**

# MANX



Thanks for going with the SJ-2!

Bit 100 v2

MM-2

XS-4

Destiny v2

Gigmate v2

